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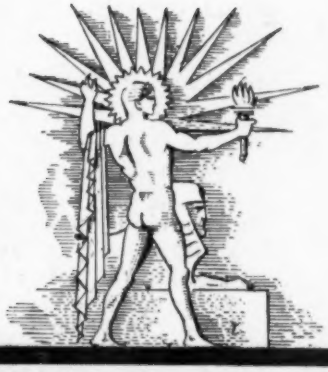
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



May 16, 1942

Gears for War

See page 319

NORTH CENTRAL COLLEGE
NAPERVILLE, ILL.

A SCIENCE SERVICE PUBLICATION

Do You Know?

Copper may have been the first metal used by man in making tools.

"Perfumes of Araby" represented the re-discovery of the ancient Egyptian art of *distillation.*

Iodine forms such an intense blue on contact with starch that it will indicate the presence of 0.0000001 gram.

By treating wrapping paper with *diphenyl,* orange shippers reduce spoilage from 9.57% to 0.37%.

Mosses have so adapted themselves that they can grow either on exposed desert rocks or under water.

Soupfin shark, now our richest source of vitamin A, was once used as fertilizer and sold for as little as $10 a ton.

At one time 60 million *buffalo* grazed on an area of more than one million square miles in the United States and Canada.

Fluorine, one of the most active elements known, decomposes water and liberates oxygen highly charged with ozone.

By altering the molecular structure of natural fiber, scientists produce a *wool* highly resistant to moths and shrinkage due to laundering.

In the Mid-Cretaceous age, the *Gulf of Mexico* extended over Texas into Colorado and Kansas, and the Pacific Coast Range was not yet elevated.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article*

AERONAUTICS

How many bombers could be built in the time lost through accidents each week? p. 311.

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What people were the earliest inhabitants of Japan? p. 314.

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ETHNOLOGY

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MEDICINE

What ills may follow an attack of German measles? p. 314.

What relative of the sulfa drugs can be used to treat tuberculosis? p. 307.

PHYSIOLOGY

What can you take to enable you to live on a diet of wood, leaves or grass? p. 308.

PLANT PHYSIOLOGY

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PSYCHOLOGY

How can rats be "psychologically vaccinated" against noise induced fits? p. 316.

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Why should you not rely on your taste to select your diet in times of scarcity? p. 309.

RESOURCES

Where will the United States get materials needed for tanning? p. 318.

The *drum* was probably man's first musical instrument.

Tar or whitewash a *rat* and its former companions run in terror.

One species of *electric fish* was venerated by the ancient Egyptians.

Harmless *table salt* is made up of two deadly poisons—sodium and chlorine.

A thick *skull* has the advantage of protecting the brain more efficiently from injury.

A pilot of a modern *bomber* can perform almost 25 operations simply by touching buttons.

In Mexico alone there are 1,200 registered *archaeological sites.*

Safety pins were invented more than a thousand years before Christ.

Mobile *optical units* to supply soldiers with spectacles have been organized by the Army and will accompany U. S. forces in the field.

Peppermint, much used in confections and medicines, also is useful in testing steam boilers for leaks and in trying out gas masks.

The modern American *soldier* is both taller and heavier than the average-citizen soldier who entered the Army in 1917, according to the War Department.

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MEDICINE

Human Trials of Chemical For Tuberculosis Succeed

Promin, Distant Relative of Sulfa Drugs, Cannot Yet Be Called a Cure, But Lungs Were Nearly Healed

HOPE for a chemical conquest of tuberculosis is encouraged by successful results in treatment of 13 tuberculous patients with Promin.

Promin, a distant relative of the sulfa drugs, cannot yet be called a cure for tuberculosis. But the 13 patients showed definite signs of improvement within two months after getting this new treatment and X-ray pictures showed the diseased areas of the lungs were nearly or entirely healed within four to six months, Dr. H. Corwin Hinshaw, Dr. Karl Pfuetze and Dr. William H. Feldman, of the Mayo Clinic and Foundation, reported at the meeting of the National Tuberculosis Association in Philadelphia.

The 13 patients were in the early stages of tuberculosis with sputum being coughed from the lungs but no extensive destruction or degeneration of the lungs. They had the kind of lung condition which often heals spontaneously without chemical treatment, the doctors emphasized. The number of patients is too small to be sure that Promin was responsible for the healing. They conclude, however, that further trial on patients of Promin and related drugs of the sulfone series seems justified.

Altogether, 106 patients have been given Promin, following the successful use of this chemical in treatment of human tuberculous infection in guinea pigs. A special study was made of 36 patients with tuberculosis of the lungs whose lungs had not been collapsed and who had been under treatment for from four to twelve months.

The most favorable results were observed on "exudative pulmonary lesions of recent origin without extensive destruction of tissue and without marked fibrosis," the Mayo Clinic doctors reported. These were the 13 patients who showed such rapid signs of improvement.

Cavities in the lungs closed in more than 10 patients and tuberculosis germs apparently disappeared from the sputum of 11 patients. Fever declined significantly in 10 of the 18 patients.

On the unfavorable side, the doctors reported one patient developed a new and progressive lesion and four patients in the group died, three being obviously in the last hopeless stage of the disease before the treatment was started.

"Six cases of tuberculous meningitis have been treated, two in early phases of the disease, but all have died," the report continued. "No striking effects were noted in four patients with renal tuberculosis, but observations are incomplete. Tuberculous sinuses have closed during treatment in four instances, but not enough time has elapsed to know if they will reopen.

"The drug is potentially toxic (poisonous) in larger doses, usually producing anemia. Dosage must be regulated carefully to avoid serious degrees of blood destruction. One case of non-fatal agranulocytosis has been observed and a few instances of transient leukopenia. Patients have complained of headache, restlessness, anorexia (loss of appetite) and malaise of mild to moderate severity.

"Long-standing cases of chronic tuberculosis, those with extensive tissue destruction, terminal stages of the disease, and tuberculosis meningitis have shown little or no tendency to improve. Trial of chemotherapy should be discouraged in such instances."

Science News Letter, May 16, 1942

DENTISTRY

Fluorine Swabbed on Teeth Cuts Down Tooth Decay

HOPE of preventing tooth decay by swabbing a chemical solution on the teeth appears in a report by Dr. Virgil D. Cheyne, of the Indiana University School of Dentistry (*Journal, American Dental Association*).

The solution is potassium fluoride. Drinking water that contains fluorides causes the ugly condition of mottled enamel, but even a small amount of fluorides in the water, it has been discovered, prevents tooth decay. However, this effect, it was formerly believed, depended on the fluorides getting into the teeth via the drinking water at a very early age, while the teeth are being formed in the jaws. Recent experiments by other scientists suggested that the fluorides might get into the teeth enamel after the teeth had erupted.

Dr. Cheyne swabbed a potassium fluoride solution every three months or so on the "baby" teeth of 27 four- to six-year-old children from the underprivileged sections of Indianapolis. All the children had decayed teeth at the start of the experiment.

One year later these children and 19 others with the same economic and dental status were reexamined. These 19 untreated children had developed almost twice as much new tooth decay as the 27 treated children.

Further tests on more children over a longer period of time will be needed for final evaluation of the method, but the results so far point to a new method of attacking the widespread problem of tooth decay.

Science News Letter, May 16, 1942

GIANT AMONG FUNGI

Fungi are usually thought of as small things, and evanescent, but occasionally a giant appears among them, more or less durable. Here is a huge puffball (Calvatia gigantea) that was found at Edmonton, Alberta, by Prof. E. H. Moss of the University of Alberta. It was 13 inches high, 14 inches in diameter and four feet in circumference, and it had survived the buffetings of a severe Canadian prairie winter. Contemplating the monster growth is Prof. A. H. R. Buller of the University of Manitoba.

PHYSIOLOGY

Syrup of Germs Devised To Help Soldiers Eat Grass

Bacteria That Do Not Cause Disease Can Also Be Planted in the Intestines To Make B Vitamins

A CHOCOLATE-flavored syrup of germs that, according to preliminary tests, enables human beings to eat grass, leaves and wood if other food supplies fail was announced by Dr. Gustav J. Martin, of the Warner Institute for Therapeutic Research, New York City, at the meeting of the American Chemical Society in Memphis.

The germ syrup, which would accomplish the desired result for a lifetime at a cost of $2 per person, is considered particularly suitable for paratroops and other army units. It seems to be the American research scientist's answer to reports that the Germans have developed a similar procedure for enabling their soldiers to live on wood, leaves or grass.

For civilians as well as soldiers, a germ syrup to supply vitamins for a lifetime is also on its way, if Dr. Martin's experiments prove successful. Certain bacteria, or germs, of a type that do not cause disease, are known to manufacture various of the B vitamins. The cow does not have to eat B vitamins in food because her rumen contains the bacteria that manufacture them. Dr. Martin's experiments are designed to develop similar germ vitamin factories in man's intestines.

Dr. Martin's work on developing germ vitamin factories and the chocolate-flavored germ syrup for digesting grass, leaves and wood has been done on laboratory animals. Preliminary tests on humans have been started in New York hospitals, but have not gone long enough for conclusive results to be reported.

The idea of creating germ vitamin factories in man's body to make him independent of food sources of vitamins or even of vitamin pills resulted from the discovery that one of the B vitamins, pantothenic acid, can stimulate the growth of those intestinal tract germs which synthesize another B vitamin, inositol. In past experiments when pantothenic acid was left out of the diet, the symptoms that resulted, such as hair graying and hemorrhage of the adrenal glands and so on, were attributed to the lack of pantothenic acid. But because there was no pantothenic acid in the diet, there was also an unsuspected deficiency of inositol. It was this unsuspected lack of inositol that was responsible for some of the symptoms attributed to lack of pantothenic acid.

Graying of the hair, Dr. Martin reported, is actually due to pantothenic acid deficiency and inositol will not cure the condition. The adrenal hemorrhages, however, are due to the inositol deficiency.

Lack of pantothenic acid, Dr. Martin pointed out, is not the only dietary lack which will produce gray hair. Restoring hair color lost through lack of pantothenic acid may be accomplished by restoring pantothenic acid to the diet. Hair color may also be restored, as has previously been reported, by doses of another vitamin para-aminobenzoic acid. This vitamin acts to "cure" gray hair, Dr. Martin is now convinced, through its action on bacteria in the intestinal tract.

Science News Letter, May 16, 1942

CHEMISTRY

Plastics Shortage Averted By New Material From Wood

A NEW plastic filler material made from sawdust, scrap wood, cotton, plant fibers or other waste cellulosic materials was announced by A. O. Reynolds of the Northwood Chemical Company and Raphael Katzen and Dr. Donald F. Othmer of the Polytechnic Institute of Brooklyn at meeting of the American Institute of Chemical Engineers in Boston.

The filler material can be combined with phenolic resins in the proportion of three parts of filler to one of resin. This gives a plastic comparable to that obtained from one part filler to one part resin when ordinary fillers are used, according to the authors of the paper. Thus the present limited supplies of phenolic resins can be made to go twice as far.

Science News Letter, May 16, 1942

WARHAWK

This new Curtiss fighter plane is said to be fast and high-climbing. Details on the performance, however, have not been released by the War Department. It is a successor to the Curtiss Tomahawk and Kittyhawk.

NIGHT FIRE

This photograph of the Curtiss P-40E, or Kittyhawk, on the new Curtiss-Wright firing range at night, is taken by the illumination of the tracer bullets being fired. Details of the firepower of this plane's successor, the new Warhawk, are being kept a military secret, so pictures like this cannot be taken of the new plane. (See facing page.)

PSYCHOLOGY

War Toys Not Harmful To the Minds of Children

Wise Parents May Be Able To Use Such Playthings To Acquaint Their Youngsters With the Facts of War

MOTHERS need not worry when their children "blitz" lead soldiers, with toy machine guns, bombing planes and tanks.

Leading psychologists and child experts say it is all right. Approval was voiced in a poll of 69 experts reported to the meeting of the Midwestern Psychological Association, by Dr. Martin L. Reymert, of the Mooseheart Laboratory for Child Research, Mooseheart, Ill.

War toys do not necessarily undermine the child's mental health. They do not instill into the children the viciousness of war.

In fact, in the hands of intelligent parents, war toys can be used effectively to acquaint children with the facts of war. This is important, since the most harmful fears are the irrational fears of the unknown.

Parents should worry about their children rather when they refuse to play war games, Dr. Reymert indicated.

In England it has been found, he said, that such refusal is a symptom of repressed tensions and anxieties.

Psychologists, although they differ on many points in regard to the harm or benefit of war toys, agree, Dr. Reymert found, that it all depends upon the personality of the individual child.

Science News Letter, May 16, 1942

Growth Changes Continue

THE CHARACTER of brain activity, which changes with increasing age all during childhood, still continues to change in adult life, it was revealed in a report by Dr. J. R. Knott, of the State University of Iowa, and Dr. Frederic A. Gibbs of Harvard Medical School.

This type of growth is indicated by brain waves, electrical impulses that originate in the brain cells themselves. These occur over a span of frequencies that may be thought of as like the light spectrum. With increasing age the red end (frequencies lower than 8 per second) grows dim while the blue end (above 8 per second) grows bright.

In the research reported, Dr. Knott and Dr. Gibbs studied the changes with growth of voltages obtained for each frequency from one to fifty cycles per second. They tapped the brain waves of individuals ranging in age from prematurely born babies of only nine days to young men of 19 years. Only males were studied, to rule out possible sex differences.

Energy below eight per second decreases with increasing age. Above eight per second, it increases as the individual grows older.

In other words there is a shift to the blue, or a shift to the fast end of the brain frequency spectrum.

Science News Letter, May 16, 1942

Taste a False Guide

WHEN people are faced with scarcity conditions and some important elements of the diet are short-rationed or completely lacking, taste and smell become unreliable guides in selecting foods that will preserve life and health.

This is the warning from researches reported to the Midwestern Psychological Association by Drs. Paul Thomas Young, Leon D. Shapiro and James P. Chaplin of the University of Illinois.

Rats were used in the experiments because their diet is so closely like that of humans and because when all the elements of diet are made freely available to them, cafeteria style, rats are able to select just what they need for their own best development.

The effect of deprivation of one food element such as the milk protein, casein, was subject of one experiment. One method was used that forced the animals to choose their food on the basis of taste and smell.

Another method forced them to choose on the basis of organic appetite — the chemical state of the body.

Taste and smell deceive; the deeper cravings of the body are wiser, it was found. When the rats chose what they liked the taste or smell of, they continued to select sugar rather than casein even after 29 days of being deprived of the needed casein. They preferred casein, however, when they judged on the basis of the body craving.

Unreliability of taste was confirmed in another experiment conducted by Dr. Shapiro in which the animals went for several days without either food or water. When relying on taste to make their choice, the rats took dry food. When they followed the dictates of their organic state, they drank instead, even though the period of total deprivation was shorter.

Science News Letter, May 16, 1942

Fast Talkers and Spenders

YOU CAN be on your guard against the smooth talker who wants your bank roll if you follow the tips given to psychologists by Dr. J. E. Janney, of Western Reserve University, speaking before the Midwestern Psychological Association meeting.

"Fast talkers and fast spenders," is how Dr. Janney summed up the personalities of both large-scale and small-time swindlers, on the basis of the experience of 40 Better Business Bureaus throughout the nation.

The small operator tends to be flashily dressed, he wants to put over his deal in secret, probably has a bad retail credit rating, will lie when investigated and feels persecuted when convicted.

The big-time operator comes right out in the open. He advertises widely, is well and conservatively dressed, and is careful to keep an excellent credit rating. But he is more likely to be truthful when investigated and sportsmanlike when convicted.

The appeals with which they work on you differ, too. If you are small prey, the swindler will play on your love for your family, any superstitions you may have, and on your desire for health and beauty.

In big frauds, prestige is used more extensively as a lever.

Big and small, swindlers make the most of the human weaknesses of gullibility, cupidity, conceit and concealment.

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CHEMISTRY

Japs Have Reproduced Nylon In Preparation for Post-War

Articles Found in Japanese Chemical Journals Show Oriental Rayon Company Is Ready To Compete in Field

JAPANESE industrial chemists are already preparing for an industrial struggle to follow cessation of the shooting war.

This is the conclusion that may be drawn from three articles published in Japanese, in the *Journal of the Chemical Society of Japan, during* 1940 and 1941. The author, K. Hosino, research man for the Oriental Rayon Company, Ltd., tells how he analyzed nylon, the synthetic plastic fiber that has made the U. S. A. independent of silk. After he had determined how the molecules were put together, he duplicated them and then made modifications which he claims are improvements over the American product.

This procedure, reminiscent of prewar tales of how Japanese mechanics would build a duplicate of any machine that Occidental manufacturers would sell to their employers, might give Japanese textile factories the means to compete to great advantage with nylon mills in this country and Europe. Japan has persistently refused to enter into any patent treaty with any foreign country, so that the du Ponts, originators of nylon and owners of basic patents thereon, will have no protection against Japanese attacks on their business.

Nylon, the Japanese chemist states as a result of his analysis, is a "polyamide of hexamethylenediamine combined with adipic acid."

If Japan goes into the nylon business, the silk industry, already hard hit first by rayon and then by the cessation of American silk purchases even before the outbreak of war, may never come to full revival. It is reported that hundreds of thousands of mulberry trees have already been felled in Japan, to make room for more food-crop production. These groves may never be replanted.

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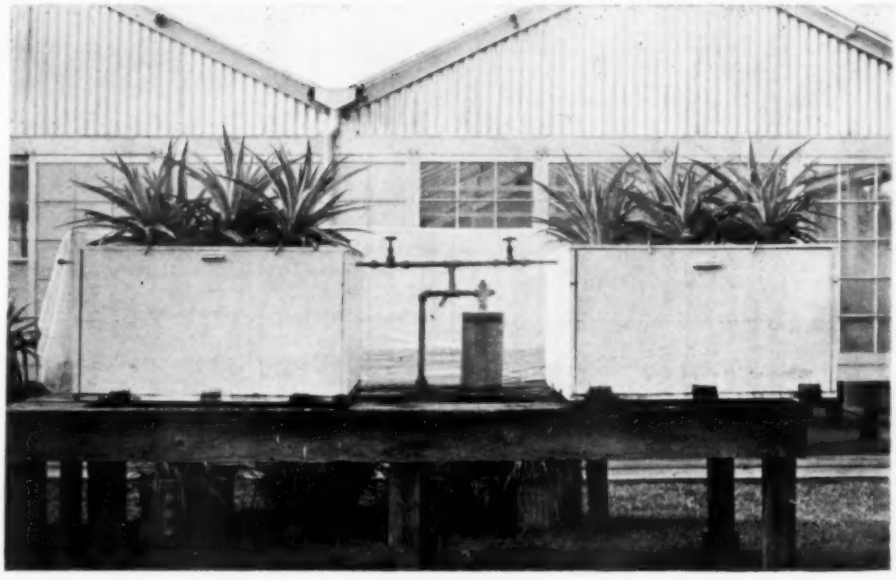
BELOW

This is how the root development in the water vapor culture box looks. These plants are three months old. This photograph and the one on the facing page are from the Pineapple Research Institute.



ABOVE

Two water vapor culture boxes showing the pineapple plants growing through the holes.
See facing page.

PLANT PHYSIOLOGY

Soilless Gardening Aids In Study of Plant Diseases

Pineapple Plants Were Kept Growing With Their Roots Dangling in Atmosphere Saturated With Water Vapor

SUCCESSFUL growing of plants with their roots dangling in an atmosphere saturated with water vapor, instead of being embedded in soil, has recently been accomplished and is expected to become an important contribution to the science of soilless gardening.

Dr. Walter Carter, entomologist for the Pineapple Research Institute, Honolulu, Hawaii, tells of his adaptation of the method in the technical journal, *Phytopathology*. In his studies of root damage to pineapple plants caused by infestation with mealybugs, Dr. Carter found that the necessary examination and sampling of roots during the experiment produced considerable mechanical injury. To overcome this difficulty, the water vapor method was developed.

This method consists of setting the plants in holes in the top of a fairly tight wooden box. Inside the box is an atomizer such as is used in air conditioning apparatus, and in keeping green vegetables from wilting in retail stores. In this device water from an ordinary main goes through a valve to form a fine jet which impinges on a flat plate. The resulting spray keeps the air in the box saturated with water vapor.

The pineapple cuttings soon begin to grow and develop roots which hang down inside the box. More vigorous growth is produced, Dr. Carter found, if a nutrient solution is added to the spray. To accomplish this, he connected an eight-quart tank in parallel with the water supply. A needle valve from the main line leads into the bottom of the tank and a pipe from the top makes a T-joint with the pipe leading to the atomizer. The fresh water gradually replaces the nutrient solution. One tankful lasts about three days. The liquid in the tank becomes progressively more dilute but this does no harm to the plants. When the nutrient solution needs replacing, the needle valve is closed and the tank drained and refilled.

The water vapor method has several advantages over other soilless methods. Once set up it is almost automatic, requiring no adjustment of acidity or refilling of jars. Root aeration is better at all times, and no trouble is encountered with algae or other contaminating organisms.

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ENGINEERING

Movie Star Can Sing And Still Look Beautiful

REACHING for that high note with with a facial contortion is a movie scene not viewed by theater audiences, thanks to a double-recording technique revealed to the Society of Motion Picture Engineers, meeting in Hollywood.

Beautiful music and good camera appearance is not always possible at the same time, Bernard B. Brown, of Universal Pictures, explained in letting out the studio secret that some of the best artists often resort to pre-scoring. The singer performs for the sound track without the camera seeing the funny faces made. Then the camera grinds while the singer does the scene again for pictures, free to concentrate on appearance and camera angles.

Tap dancers frequently use a reverse method, first performing for the eyes and then for the ears, on a sound stage.

Science News Letter, May 16, 1942

AERONAUTICS

65 Bombers Could Be Made In Time Lost By Accidents

STARTLING costs in manpower of industrial and other accidents are revealed in figures from the Metropolitan Life Insurance Company.

Each week at least 800,000 employee days, enough to make 65 bombers, are lost in absenteeism due to temporary disabilities sustained in occupational accidents.

Enough working time to build eight destroyers is lost each week, in addition, through fatal occupational accidents or those causing permanent disabilities.

Enough men for 16 Army divisions were lost in accidents of all kinds which took the lives of boys and men in the United States during the past 10 years. Motor vehicle accidents alone during this period robbed the nation of 110,000 potential soldiers, sailors and fliers.

Science News Letter, May 16, 1942

The mathematical symbol *zero*, without which our mathematics would be impossible, was apparently invented by the Hindus twelve or fifteen hundred years ago.

Conserve By Learning To Splice Rope

Hemp and Sisal Are Scarce and Needed

SCIENCE
Serving Science Clubs of Ame Spon

By JOSEPH H. KRAUS

Editor, Science Clubs of America

Conservation is a watchword these days. Every item, from toothpaste tubes and razor blades to iron kettles and stoves, is worth saving regardless of its condition; even the cooking fats and meat bones which you once were wont to throw away can contribute to America's vital war effort.

So far little has been said about rope; but your washline and other heavier rope will warrant your attention. And while it once was a hobby to see how large a ball you could make from string which was used to bind your purchases, today it becomes a patriotic duty to do so.

Not only is there a scarcity of materials such as hemp and sisal from which much rope is made, but these fastenings also are needed for our expanding naval arm.

Much rope is lost because little attempt is made to stop the fraying of the ends. Often, too, new rope is substituted where a spliced length would serve the purpose just as well. Knots incorrectly made or frequently tied and opened again play havoc with rope fibers and make the rope wear out more quickly.

Everyone should learn a few things about rope, particularly how to make knots properly. It would be impossible to cover this subject in a short article. Nevertheless, the hints given here should be of considerable value.

No great amount of technical skill is required to learn a few tricks in the handling of rope. A short piece of rope, three or four feet long, is the only practice material needed.

It may take a little time to examine the drawings or to read the description of a special rope technique but after you have performed the operation once you will find that it is much more simple to do the trick than to read about it.

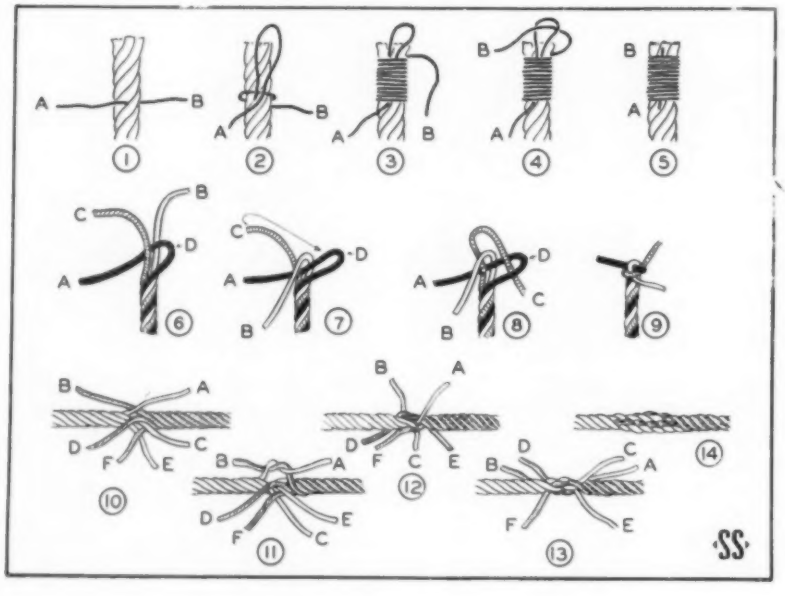
In the illustration below, Figures 1 to 5 show how to whip the end of a rope. A piece of twine, preferably fishline, is passed under one of the strands as shown in Fig. 1. End B is left long; end A is relatively short. Wrap end B once around the rope immediately above the exit of A. Now make a loop, or bight as it is commonly called, with end A and permit the return portion of the loop to rest in a groove in the rope. Holding this loop with the thumb, wrap the rope with the twine to within one-eighth of an inch of the top. You now have produced the effect shown in illustration 3.

Pass the free end B through the loop at the top, draw B tight, then pull A until the free end of the twine vanishes beneath the wrapping. Clip off both ends as shown at 5 and the job is finished. A modification of this method often is used for wrapping bamboo fishing poles.

If no twine is available or you do not want to use this method for some particular reason, the free end of the rope can be protected with a crown knot. Here again, as before, the description sounds more complicated than the actual performance. Try it and see.

The crown knot also is to prevent the ends of a rope from unravelling. Holding the rope as shown at 6, form a loop, D, with strand A. This movement places strand A between strands C and B. Now carry strand B over the loop, then forward and downward.

This will give you the effect shown at 7. Put the left thumb on strand B and you can let go of end A. Now bring C around in front of B and pass this through loop D. Pull all three free ends of the rope evenly to produce a crown knot. This explanation may sound complicated but it really is much more simple to do or demonstrate.



Examination will reveal that in the knot so formed each loop bites an adjacent strand. No further action need be taken now; but if desired, the long free ends of the rope may be tucked in as in illustration 13, which will be explained later.

In splicing ropes several methods are employed. The one here given is known as the "short splice." At the point of this splice the rope becomes twice as thick as normal. While such a splice may not pass through standard pulley blocks, it presents no problem to the average washline pulley.

Untwist the strands for six or eight turns at the two ends of the rope where the splice is to be made. Now butt these ends together so that each strand of one rope lies between two strands of the other rope. This is shown in Fig. 10. Notice that strand D lies between A and C; on the other hand, C lies between D and F.

Take two adjacent strands and tie them together with a simple overhand knot. Make sure that when tying this knot you follow the general twist of the rope. Illustration 11 shows the first stage of this knotting operation with a knot being tied between strands A and B, coming respectively from the left and right ends. Illustration 12 is the next step and shows the knot pulled down tight.

Pick up any one of these ends; B for example. Press this against the rope and observe that it crosses the spirally wound main rope approximately at right angles to the turns. Skip over the first strand (viz., the strand adjacent to the place where the end emerges) but raise the second adjacent strand. Weave end B under this second strand. Proceed in a similar fashion all around the rope at both ends always skipping the adjacent strand and tucking in under the second one. In this way you will produce the effect illustrated at 13.

The tucking operation is easy, if you will just remember to cross the strands approximately at right angles and always skip the strand immediately adjacent.

In very heavy ropes the tucking operation may be expedited by using a pointed, tapered wood rod to raise and separate the strands. Such a tool is called a marlinespike.

After you have mastered the method of tucking in the strands you will want to add the professional touch. To do this grasp the tucked strand firmly between thumb and finger close to the overlaying strand. Twist the fingers and thus

OBSERVER

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unravel the rope at this spot. This operation will spread the fibers and produce a thinner splice.

Repeat these operations over several strands and then cut out some of the fibers so as to thin down the rope. This forms the perfectly tapered splice shown at 14.

Science News Letter, May 16, 1942

NEWS OF CLUBS

PITTSBURGH, Pa.—Most students dread the thought of a quiz, test or review. Teachers, on the other hand, find these periodical check-ups absolutely essential. Changing the quiz into an exciting game in which sides vie for the honors is the method which has been successfully worked out by Sister Mary Aelred, O.S.F., B. Ed., sponsor of the Curious Chemites Club at St. Wendelin High School. This same game enables the teacher to evaluate the student's knowledge. Sides are chosen and the name of each player is recorded on a separate card. During the baseball season, the game is played by having nine-man teams. The cards are shuffled. The first player selected (from the shuffled cards) picks out a question from a box. If he answers it correctly he goes to first base. Failure to answer the question is an "out". Correct answers to especially technical questions may entitle the student to a "three-bagger". The play is then continued like a baseball game.

The game in its baseball and football modifications is described in detail in a recent issue of the Science Counsellor. Needless to say, this kind of a quiz is enjoyed by the students.

KALISPELL, Mont.—A buying service for amateur scientists is being operated by the Kalispell Amateur Chemist Society, an independent group formed here. Such a buying service is an excellent plan for any science club. It is the duty of a small group in the club not only to get information as to where to buy necessary materials but also to serve as an outlet through which surplus materials may be disposed of to others in need of the supplies. This is particularly true today when so many materials are no longer available from the usual supply houses. The Kalispell Amateur Chemist Society is sponsored by Waldemar Olsen, science teacher.

KEENE, N. H.—Scientific apparatus which will be used by students in the years to come is being made by members of the Physics Club of Keene High School. Charts which will be useful to future classes, illustrative materials which will help in teaching science, and equipment which is not obtainable today are being completed in record time. That sort of a long range program definitely is linked to America's immediate war effort and to the educational future of those who will enter high school after the present war is over. This is one stage of science club activity which has not been given much publicity but it is something in which every science club can engage. The sponsor of this club is Arthur Houston, physics instructor.

GRASS VALLEY, Calif.—The welding of parts for the mount of an eight-inch reflecting telescope has been completed by members of the Science Club of the Grass Valley High School. Some of the members of this club are taking machine shop work and part of the training they receive includes welding. How closely this science club activity is keyed to our war effort requires no great stretch of the imagination. Any person able to weld parts accurately for a telescope mount can, with little training, weld fins on aerial bombs, or airplane parts or direct the welding operations of others not so well trained. This Grass Valley club has been responsible for many unique surprises. Its House of Magic program put on last year was viewed by more than 300 spectators. Its assembly programs are spectacular and its Stunt Nite is showy. J. B. Underwood, head of the Science Department, is sponsor of this club.

DURANGO, Colo.—Determining the constituents of commercial products such as toothpaste, paints, varnishes and cosmetics, and synthesizing various chemical substances used in everyday life, are the activities being undertaken by members of the Research Club at Durango High School. Not only does this program play a useful role today but it instructs members in the practical side of analysis and synthesis and will make better chemists of each one of them. The group is sponsored by Wayne Cruse, chemistry instructor.

MILFORD, Conn.—At present members of the General Science Club at the Milford School are studying rocks and minerals. When weather permits nature trips are undertaken expressly for the purpose of collecting mineral specimens in the vicinity of the club. Among these trips will be a visit to the Roxbury Mine in Connecticut.

In addition to this group activity, individual effort is encouraged. The club is sponsored by Jerry Pepper, director of athletics.

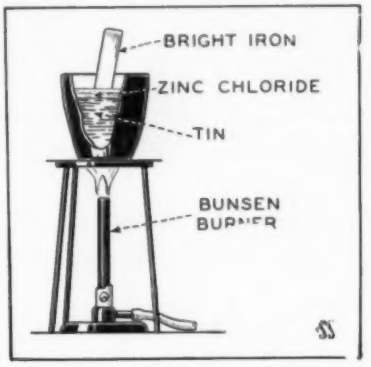
FRANKFORT, Ky.—Birds and animals are being mounted by members of the Science and Photography Club at Mayo-Underwood School. The members of this club also prepare assembly programs, give demonstrations with scientific equipment, make field trips, take and develop pictures, and experiment with radio, telescope-making and the soilless growth of plants. The club is sponsored by Asberry P. Jones, science instructor.

Clubs are invited to become affiliated with SCA for a nominal $2 for 20 members or less. You can become an associate of SCA for 25 cents. Address: Science Clubs of America, 1719 N St., N.W., Washington, D. C.

Science News Letter, May 16, 1942

Experiment With Tubes

Many of the collapsible tubes from which toothpaste, shaving cream, various salves and ointments are dispensed are made almost entirely of pure tin. Save this tin. Not only may it be used for experiments but such salvage will be valuable in America's war program.



Melt several of these toothpaste tubes in a small crucible. Skim off any dross which forms on the surface. You can use a flat piece of wood to do this. While the tin is in a molten state add some solid zinc chloride to form a molten layer one-eighth inch deep on the surface. With the tin still hot introduce a polished piece of iron. (Iron may be brightened by using sandpaper.)

You will observe that when the iron piece is removed from the molten mass it will have a bright coating of tin. This coating is tin plate, similar to the plate on tin cans. It does not scratch off easily.

The zinc chloride, mentioned before, serves as a "flux." Try the experiment without the zinc chloride and you will find that the polished iron does not acquire a tin coating.

Science News Letter, May 16, 1942

How To Make Grass Whip

A grass whip is an ingenious tool for cutting grass in hard-to-get-at places. The tool can be made in about 20 minutes.

If you have an old golf club, the shank of this will make the handle of a tool; if not, use an old broom stick. At the bottom mount a bent strip of metal and to this secure a strip of wood. For convenience in handling it is not recommended that this wooden strip be longer than about six or seven inches. To the strip attach razor blades so that the sharp edges of the blades extend beyond the wood. Wood screws will hold the razor blades in place. (Use brass screws if you can get them.) Taper the front edge of the wooden piece (the edge under the razor blade) and the tool is finished.

To use the grass whip swing it as you would a golf club. When the tool becomes dull remove the razor blades and save them. The steel in them is still useful.

The grass whip is one way to utilize your old razor blades. Wipe the tool dry after each use and apply a thin film of oil to minimize rusting.

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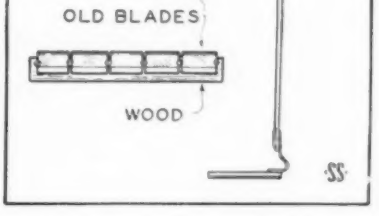

SCIENCE CLUBS OF AMERICA

SCA, under Science Service sponsorship, continues the pioneering activities of the American Institute of City of New York over the past 15 years and the Student Science Clubs of America which was merged with that movement. The American Institute continues to foster the regional activities of the junior clubs of the New York City area as a science center.

To effect close cooperation between the American Institute and Science Service, an advisory committee on SCA is being formed.

The principal SCA staff consists of Joseph H. Kraus, SCA editor, and Margaret E. Patterson, SCA membership secretary, based at New York in offices at 310 Fifth Avenue, also occupied by the American Institute. H. D. Lufkin in charge.

MEDICINE

Smoking, Not the Nicotine, Raises Blood Pressure

Tests on Ten Normal Men Show Same Results Whether Cigarets Were Made of Tobacco or of Corn-silk

IT'S the smoking, not the nicotine, that raises the blood pressure of cigaret smokers, Dr. Willis F. Evans and Dr. Harold J. Stewart, of the New York Hospital, have discovered.

Their findings, which seem to have smoked out the "Demon Nicotine" myth of the old anti-cigaret propaganda, were reported to the American Society for Clinical Investigation in Atlantic City.

Tests were made on 10 normal men who smoked different types of cigarets. In all except four instances there was a moderate decrease in the amount of blood allotted to the tiny blood vessels near the surface of the body, a rise in blood pressure, faster heart beat and chilling of fingers, toes and body surface. But these changes were of essentially the same magnitude and lasted as long regardless of whether the men smoked regular cigarets, commercial denicotinized cigarets, fully denicotinized cigarets, corn-silk cigarets or smoked cigarets through a water pipe.

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German Measles Serious

GERMAN measles, which some of its victims may now be calling Nazi measles, is a far more serious disease than has been supposed, Dr. Mark P. Schultz, of the U. S. Public Health Service, declared.

An attack of German measles can bring on rheumatic fever and heart disease, he reported.

First knowledge that this supposedly harmless childhood ailment could be a serious disease comes from England, where it has caused trouble in the Army, leaving its victims with rheumatic heart disease or arthritis. The English medical opinion is that the virus which causes German measles may have changed its character.

Most cases of rheumatic fever and rheumatic heart disease are started by hemolytic streptococcus germs. Some cases, however, are started by a variety of other things, and one of these may be German measles, Dr. Schultz said.

Among 50 Washington, D. C., school children who had German measles during a serious epidemic there last year, three were left with rheumatic heart disease, Dr. Schultz reported.

When rheumatic fever follows German measles in young adults, it affects the joints chiefly. In children the heart is attacked.

Every effort should be made, in view of these new findings, Dr. Schultz emphasized, to prevent the spread of German measles by quarantining those who have it or may be coming down with it because they have been in contact with a patient. This may interfere with troop movements and has therefore been hotly debated in England, but Dr. Schultz believes the quarantine worth trying.

Science News Letter, May 16, 1942

MEDICINE

Sulfa Drug Proved Harmful In Nasal Injections

EVIDENCE that sodium sulfathiazole, recently advanced as the long hoped-for beneficial treatment of sinus trouble, actually is dangerous is reported in the *Journal of the American Medical Association* (May 2)

A series of rabbits were given nasal injections of 5% solution of the sodium sulfathiazole by Dr. Charles E. Futch, Dr. Lloyd K. Rosenvold and Dr. Charles E. Stewart, Jr., of Los Angeles. They found serious damage to the animals' mucous membranes, the tissues that line the inside of the nose. After a week's rest from the nasal injections, "there was little recovery from the destructive process," they report. The 5% solution had been recommended as a nasal spray for human sinus infection.

The three physicians found the 5% solution and a 30% solution both highly alkaline, and suggest this may be a factor in causing the damage to the nasal mucous membrane. They express the hope that chemical combinations of the sulfa drugs which are non-irritant may be developed.

They warn, however, that chronic sinus trouble is too complex a disease to be cured with a single medicine.

Science News Letter, May 16, 1942

Deaths with Sulfathiazole

DEATH of four persons receiving sulfathiazole and extensive damage to their internal organs from the drug also is reported in the *Journal of the American Medical Association* (May 2).

From their studies of the four fatal cases, Dr. Max Lederer and Dr. Philip Rosenblatt of Brooklyn suggest how this valuable drug may be used more safely.

They warn against indiscriminate and uncontrolled use, and suggest examination of the urine during treatment for crystals and blood. A chill followed by sustained fever is a signal to discontinue the drug at once.

"Sulfathiazole," they conclude, "should be used only when definitely indicated and should not be continued longer than is absolutely necessary."

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ANTHROPOLOGY

Japan Was Once Ruled By Line of Women

JAPAN, where women are very decidedly "kept in their place" in modern times, was once ruled by women. The time was so near the dawn of history that definite written records are very scanty, but very early sources, part of them Chinese, tell of a great Queen Wo, who was succeeded by other female rulers, all of them marrying their own brothers and handing down the scepter from mother to daughter.

This is among the little known facts about the origins of Japan revealed by Carl Whiting Bishop, Smithsonian Institution archaeologist.

So powerful was the influence of the Japanese queens, and so firm the tradition of female dominance, that early Chinese records refer to Japan as "the Queen Country." Subsequently, however, their power was weakened and they were relegated to a religious position as high priestesses of the Sun Cult, while real power in the land was held by the founders of the line of the Mikados who in their turn, centuries later, were likewise thrust aside by an ambitious oligarchy of aristocrats.

Earliest inhabitants of the Japanese islands, Mr. Bishop states, were the Ainu, a very primitive race with light skin and wavy hair, sometimes though probably erroneously referred to as Asiatic

white men. They more likely represent a general primitive stock, older than any of the present-day well-differentiated races.

These Ainu were brave warriors, but they could not stand against the more numerous and better armed Mongoloid invaders from the mainland who arrived about 2,000 years ago. However, the resistance they put up had much to do with the development of the Japanese as a warrior people. There is also a strong Ainu strain in the modern Japanese ruling class. Only about 20,000 pure-blooded Ainu remain, mostly on the island of Yezo.

A third racial strain, also strongly in evidence in the Japanese ruling caste, came later from China, partly direct and partly via Korea. This second wave of mainland incursion brought with it much of the basis from which Japanese culture developed.

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CHEMISTRY

Curare Is Now Isolated In Pure Crystalline Form

In this Condition It is Four Times as Powerful as In Extract and Strength Can Be Maintained Uniform

ONE of the deadliest of all poisons, used by South American Indians on their arrows to kill both game and enemies, will be made more reliable in medicine as the result of studies reported at the meeting of the American Chemical Society by O. Wintersteiner and J. D. Dutcher of the Squibb Institute for Medical Research.

The poison is known as curare, or more specifically as tube curare. It has long been known through study of arrow poisons obtained from the Indians, but because its source was uncertain, and because it was mixed with snake venoms and other foreign substances, its composition has remained a chemical puzzle and its medical use has been less dependable than physicians would like.

Like many other poisons, curare is a beneficial medicine when used in small enough doses. It is valued as a counteractant to metrazol, the shock-treatment drug now popular in medical circles, for "jolting" insane patients out of their unhappy state. Curare is also used in certain paralytic cases, to relax tightened muscles.

Messrs. Wintersteiner and Dutcher have succeeded in isolating the active principle of tube curare in crystalline form, which means they have obtained it chemically pure. In this condition it is four times more powerful than it is in the extract from which it was obtained. It is a white powder, and its chemical composition is expressed in the formula $C_{36}H_{44}O_6N_2Cl_2$. In such pure form, it it is easily tested and its strength and uniformity of action can be maintained.

Tube curare is obtained from a vine of the upper Amazon and Orinoco valleys, known as Chondodendron tomentosum. It has no common name, but it is related closely to the ordinary moonseed, a wild vine frequently found in American woods.

A second kind of curare, known as calabash curare, quite different from tube curare, comes from an unrelated group of plants, another species of which is the source of the common poison, strychnine.

Science News Letter, May 16, 1942

Manganese Strengthens

MANGANESE, the alloy metal that makes steel stronger, performs a like function in bone formation, it is indicated by researches reported to the American Chemical Society in Memphis by Willis D. Gallup of the Oklahoma Agricultural Experiment Station.

Poultry and game birds reared in confinement often develop a crippling disease known as leg-weakness or hock disease, which seriously damages their market value. This, Mr. Gallup has shown, is due to a lack of manganese in their diet. Manganese lack also causes a falling off in egg production, and an increase in the number of eggs that fail to hatch. Restoration of manganese to the birds' rations will not cure the disease once it has become established, but it will prevent its development. It will also raise the number of eggs produced and increase hatchability.

There is no danger of poultrymen and feed processors running into priority troubles on account of manganese, for very little of it is needed for poultry-feeding purposes. Exact ratios have not yet been determined, but the requirement seems to be less than ten parts of manganese in a million parts of feed. In this again, the role of manganese resembles the part it plays in steel production, where a few spoonfuls make radical differences in the quality of a batch of many tons.

Manganese in bone-strengthening foods does not even have to come from ores. Small traces of the metal exist in most soils, and become concentrated in green feeds and the outer coatings of grains.

Earlier researches by other workers have already shown that manganese has something to do with the formation and utilization of the B and C vitamins, also that an extreme manganese lack causes a lapse in the maternal instinct in animals. Because of the latter phenomenon, it received some years ago the nickname of "mother-love element."

Science News Letter, May 16, 1942

Vitamin May Harm

NICOTINIC acid, the vitamin that saves lives by preventing and curing the disabling "hard times disease", pellagra, can work harm as well as good, it has been shown in experiments reported by Prof. Jakob A. Stekol of the Vanderbilt University School of Medicine.

Prof. Stekol fed young male rats on a synthetic diet short in casein, one of the important protein foods. At the same time he gave them enough nicotinic acid to make up one per cent of their rations—far more of this vitamin than goes into the normal diet of either human beings or any experimental animal. The rats' growth was stunted. Curiously enough, parallel treatment of young female rats had no effect on their growth.

Science News Letter, May 16, 1942

Poison Cures Poison

A LITERAL case of poison against poison was laid before the Society by A. L. Moxon and H. D. Anderson of the South Dakota Agricultural Experiment Station. In parts of the Northwest, selenium poisoning is a serious problem in the livestock industry. The poisonous element exists in the soil, gets into plants which the animals eat, and cripples or sometimes kills them.

In careful experiments, Mr. Moxon

and Mr. Anderson have found that selenium poisoning can be stopped by giving the animals very small amounts of arsenic, in their food or drinking water, or in the salt which ranch cattle eagerly seek. Concentrations as low as 12 to 25 parts per million were found effective in the treatment of dogs, chickens and cattle.

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PSYCHOLOGY

Sensitive Rats Made Immune To Fit-Producing Noises

Preceding Seizure-Causing Noise With Another To Which Rats Are Not Sensitive Protects for a Week

PSYCHIC "vaccination" against the nerve-shattering effects of war noise is a future possibility, it is suggested by a report to the Midwestern Psychological Association meeting in St. Louis.

Noise-sensitive rats that ordinarily would be thrown into fits similar to epileptic seizures by certain shrill or irritating noises have been made immune to the seizure-producing sounds, Dr. Norman R. F. Maier, of the University of Michigan, told the meeting. The immunity lasted for several days.

The protecting treatment consisted merely of preceding each seizure-producing noise with another to which the rat is not sensitive. Continuation of this procedure with daily tests for about two weeks makes it possible to expose the rats to the seizure-producing sounds without harm.

After a week without tests, the animal is again susceptible.

Fatigue and a lowering of body temperature by swimming in cold water also prevented the seizures in all susceptible animals.

The noise-induced seizures in rats are due, Dr. Maier concludes, to nervous tensions, and if enough preparation is given the organism can adjust. In states of low energy the tensions are not sufficient to break through and get control of the animal.

Just how closely the noise-induced fits of susceptible rats resemble the jumpy, jittery nerves produced in some humans by the explosive blasts, shrieking shells, and roaring dive bombers of modern war is not yet known to psychologists.

But the fact that a means has been found for protecting the rats by this sort of psychological immunizing process raises hope that some similar method may be developed for helping humans to protect their nerves against war damage.

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★★★★★★★★★★★★★

WYOMING

Fish in its mountain streams. Ride horseback thru its hills and canyons. Find Indian relics and marine fossils in this region of great historical and geologic interest.

The Patons welcome a limited number of guests at their ranch home in the Big Horn country. Cabins are comfortable, food good and horses gentle.

Write for illustrated folder with map

Paton Ranch, Shell, Wyoming

Monkeys Sort By Quality

MONKEYS are capable of some of the abstract thinking which has been considered an exclusive ability of humans, Dr. Benjamin Weinstein, of the University of Wisconsin, revealed.

He told of teaching a monkey to distinguish objects on the basis of their qualities, apparently working with such "human" concepts as mobility or color.

The monkey was first permitted to handle and examine pairs of objects, one of which was movable and the other fixed. Later he was shown a tray of objects containing replicas of the samples he had seen. He learned to select always the duplicate of the movable object and leave untouched the duplicate of the fixed object—regardless of position on the tray or other similarities.

Science News Letter, May 16, 1942

The presence of *lactic acid* gives sour milk its characteristic taste.

The human *thigh-bone* (femur) is the strongest, heaviest, and longest bone in the skeleton.

● RADIO

Saturday, May 23, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Lionel S. Marks, professor of mechanical engineering, emeritus, of Harvard University, will discuss the main sources of power immediately and practically available in the world of today.

Tuesday, May 19, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.

ETHNOLOGY

Eskimo Women Are Making Boots For Alaska Troops

UNDER the flickering Northern Lights of Alaska, hundreds of Eskimo women are stitching reindeer and sealskin into the world's warmest boots for American doughboys stationed at this country's northernmost defense bases.

The Army Quartermaster Corps has arranged through the Interior Department for purchase of reindeer boots "guaranteed" to keep a soldier's feet from freezing in the Arctic snow.

The Eskimo women are the same who helped to equip the Byrd expeditions, and are at work from Nome to the northernmost Army stations.

The bottom or foot section of the boot is usually made from Oogruh or "big seal" skin, while the upper portion is of soft reindeer hide. All sewing is by hand with reindeer sinews.

In making a boot, the Eskimo women crimp the edges where seal and reindeer hide join with their teeth, which become sharp as razors and wear down to the gums.

About a year ago, the Army purchased $15,000 worth of furs and footgear from these women, and found the clothes exceptionally warm, well-fitting and long-lasting.

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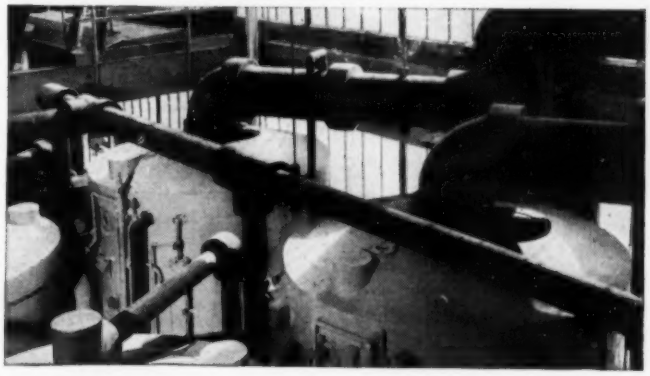
Books

SCIENCE NEWS LETTER will obtain for you any American book or magazine in print. Send check or money order to cover regular retail price ($5 if price is unknown, change to be remitted) and we will pay postage in the United States. When publications are free send 10c for handling.

Address Book Department
SCIENCE NEWS LETTER
1719 N St., N. W. Washington, D. C.

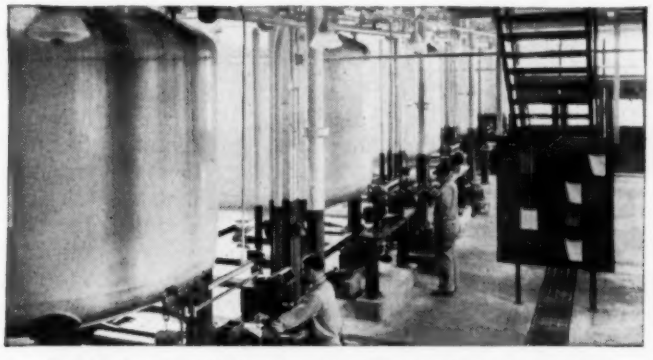
Can you identify this industry?

(IT HELPS GIVE EXTRA POWER TO AMERICA'S WARPLANES)

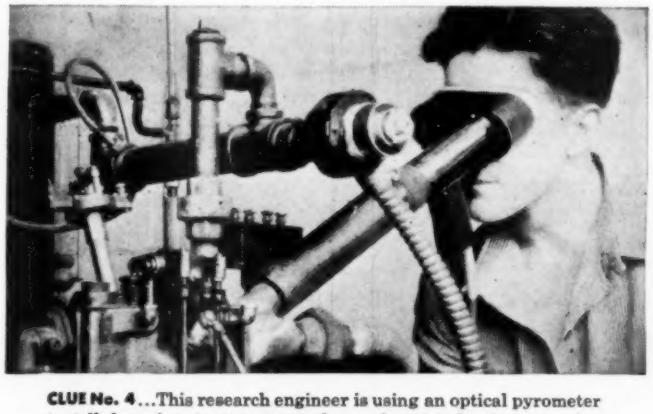


CLUE No. 1...The basic raw materials used are—salt, sulphur, sea water, molasses, lead and petroleum gas. This picture shows part of the equipment for evaporating salt brines to produce table salt.

CLUE No. 2 . . . The battery of compressors above is used to compress petroleum gases to make ethyl chloride. This chemical is very necessary—but there is not a drop of it in the finished product.

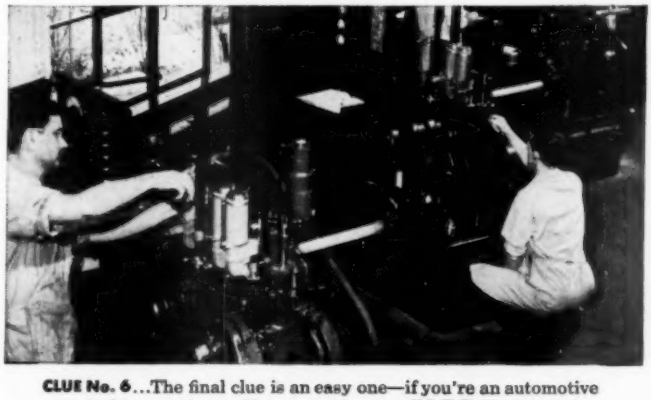


CLUE No. 3...Tons of the various ingredients that make the finished product are blended in these weigh tanks at one time. They measure the ingredients accurately to within one part in ten thousand.



CLUE No. 4...This research engineer is using an optical pyrometer to tell, by color, temperature of an exhaust valve in an engine running "wide open." Research is very important in this industry.

CLUE No. 5 . . . Painting a drum to ship the product overseas for war use. Each drum is cleaned and painted gray each time used, so the least leak of brightly colored product would show immediately.



CLUE No. 6...The final clue is an easy one—if you're an automotive or petroleum engineer. These machines are "C.F.R." knock rating engines which are used in the six gasoline-testing laboratories.

It's probably no secret to you by now—these are a few pictures of the company that produces Ethyl brand of anti-knock fluid. Oil refiners use Ethyl fluid to produce the high-octane gasolines that give extra power to America's warplanes, tanks and other motorized equipment. Fortunately, the Ethyl Corporation has sufficient plant capacity to supply all war needs without delay and still produce anti-knock fluids for improving gasoline used in the tractors, trucks, buses and passengers cars of our motor transportation system.

GENERAL SCIENCE

NATURE RAMBLINGS

by Frank Thone

Try It on Two Dogs

CONTROLS, to a scientist, do not mean devices whereby a mechanism or an animal is guided or compelled to a certain course, like the motorman's control box on a streetcar or the reins of a horse. In the scientific sense, the word is used in a special way. It means duplicate experimental objects subjected to exactly the same set of conditions, except for the one thing under investigation. The scientist might say, "Try it on two dogs first—but don't do anything to one of the dogs."

To take a specific example: Suppose you had a new plant extract suspected of being highly poisonous to rats, and hence valuable as a rodent exterminator. The first impulse would be to try it on a rat—or better still, on a half-a-dozen rats, or maybe a hundred of them. If they die, you conclude the stuff killed them.

But the biologist wouldn't accept your results. He would ask, where are your controls? He would repeat the experiment, in perhaps exactly the same way, but with the important difference that alongside the rats getting the suspected poison would be another batch—rats of the same ancestry for choice—getting the same kind of food and water, living in the same cages, sharing the same life-conditions all along the line, except that they would not get the presumed poison.

If the first batch of rats all died and the controls all survived, there would then be reason to believe that the new substance was poisonous. In the absence of controls, the animals might have died of the poison—or again there might have been a sudden epidemic that swept the cages, or a leak of carbon monoxide gas from a faulty furnace, or some other unknown lethal agent that would falsify the results, leaving you deceived. Hence the importance of controls.

Science News Letter, May 16, 1942

Message to TEACHERS

Science advances—12 months of the year. This is true even more this year because science advances at an accelerated pace during War time. It is just as important to keep informed on science as it is on the various battle fronts of the world.

What new inventions, what new discoveries, what new *knowledge* is science uncovering? You will want to know all during the summer.

In past years there have been some teachers who have not received Science News Letter during their summer vacations, but who resubscribed every fall. Science, however, doesn't take a vacation.

The twice-a-year complete indexes, cross-indexed by the name of the scientist and subject, make the year-round file of Science News Letter valuable in reference work for students and for yourself. A school year subscription naturally omits some of this valuable reference material.

While you are taking your school vacation, let Science News Letter work for you filling in during the summer months, the complete news of science.

To Science News Letter, 1719 N St., N. W., Washington, D. C.

Keep my Science News Letters coming during the summer—don't let the subscription lapse. (Please fill in your name and address as it appears in the margin of the last page of this issue.)

Name.....

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RESOURCES

Peru Hopes To Increase Tanning Extract Exports

WITH Eastern Hemisphere sources hampered by the war, the United States is looking southward for the raw materials needed for tanning its growing Army's footwear.

Smiling hopefully under U. S. gaze is Peru, where the wild tara bush grows, and whose coastline is on the wrong side of the continent for Nazi submarines. Already tara from Peru has replaced sumac from Italy, balonia from Greece and myrobalams from India in tanning blends, used in this country.

Exports from Peru have risen rapidly in late years—490 tons in 1939 and nearly three times that amount in 1941, largely to the United States. It is now urged that plantations of tara be established on thousands of uncultivated acres along the west coast of Peru.

Tara grows wild along the semi-arid foothills of the west coast. It bears a long pod filled with seeds. Pod and pulp which surround the seeds have a tannin content of 50% to 60%. This is even higher than that found in sumac. Tara is further desirable because it imparts little color to the leather when used in treatment.

U. S. Department of Commerce economists feel that if Peru will develop her production facilities, she will find a rich and permanent market in the United States. The tanning business in this country in 1939—the last peacetime year—was greater than in all of Europe, including the United Kingdom.

Science News Letter, May 16, 1942

Marks of *raindrops* have been found in rocks millions of years old.

New Machines And Gadgets

Novel Things for War-Time Living

Rust is prevented at the source by a special cream with which the workman coats his hands before working with highly polished precision parts. A bit of perspiration or a fingerprint may start the rusting process, and this is not stopped by afterwards coating the piece with a rust-preventing compound. Rather it is sealed in. Gloves could of course be worn but are a hindrance when doing fine precision work.

Recording of telephone conversations is provided in an invention recently patented. Both the sender's voice and that of the distant speaker are recorded, so that misunderstandings and lapses of memory can be avoided when placing orders or making other business arrangements over the telephone. The device can be cut in or cut out as desired.

Filling sand bags usually requires two men, one to hold the bag open while the other shovels in the sand. This can be avoided by a simple lightweight device that holds the bag open. Since the bag all the while rests on the ground, the filler is readily removed when the bag is full without lifting the bag. The device was originally intended for filling coal sacks, but war brings new uses for many things.

Protection from holdups, especially in banks, is the object of an invention that has recently secured a patent. When the thug thrusts his ugly pistol through the window, the teller steps on a switch, and the device releases a succession of glass tear gas bombs which smash when they hit the floor or other hard surface and release their discouraging contents.

A hobby horse that moves slowly forward when rocked has recently obtained a patent. "Progressive" hobby horses have been provided in the past, the inventor states, but the mechanisms were complicated and even dangerous—likely to pinch a child's finger. This one gets its motion very simply by pushing on the carpet with its tail, although this style of locomotion would seem more appropriate to the kangaroo than the horse.

A black-light flashlamp that can throw a beam of black light to a distance of 10 feet and light up any fluorescent material that may be there, has recently been perfected. Originally intended for snooping around in mines in search of tungsten ore, which is fluorescent, it should be useful also on blackout nights to pick up fluorescent markings. In case such markings are absent, a regular flashlight is included. The whole outfit, including batteries, weighs but 7½ pounds.

Synthetic rubber thread is what you see in this picture. It is being made now exclusively for military purposes, for harness of parachutes, for gas masks and respirators, and other equipment. None is at present available for civilian products, and there is no indication when it will be available for such purposes. The new thread will stretch to eight times its original length, which is comparable to natural rubber thread, while its resistance to the action of perspiration, chafing, dyeing and bleaching are said to be better.

Sewage sludge has two valuable uses as was discovered in a small city sewage treatment plant. The sludge placed in the digesters developed enough gas to run the gas engines and heat the building. The dried sludge thrown outside proved to be a good fertilizer, containing nitrogen, phosphoric acid, potash and humus. Now the plant is making some of its expenses by selling the sludge.

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 104.*

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ENGINEERING

Huge Gears Transmit Power Of Turbines to Propellers

See Front Cover

THE MIGHTY gears shown on the front cover of this week's SCIENCE NEWS LETTER are used on large ships to transmit power from high-speed turbines to the slower propeller shafts.

The smaller or pinion gear on the turbine shaft meshes with the larger gear on the propeller shaft. The herring bone arrangement of the teeth on both gears prevents end play and makes for smooth running.

Turbines are more efficient at high speeds, propellers are more efficient at low speeds. Gearing enables both to work at their best.

Improvements in turbines and boilers as well as in gears enable the modern warship to operate with 25 to 40% less fuel per horsepower-hour than the same type of vessel in the first world war. The saving in fuel permits the ship to carry more weight in armor and guns, or to carry more fuel and thus strike at a more distant enemy.

Science News Letter, May 16, 1942

SEISMOLOGY

Caltech Seismographs Record Naval Gunfire

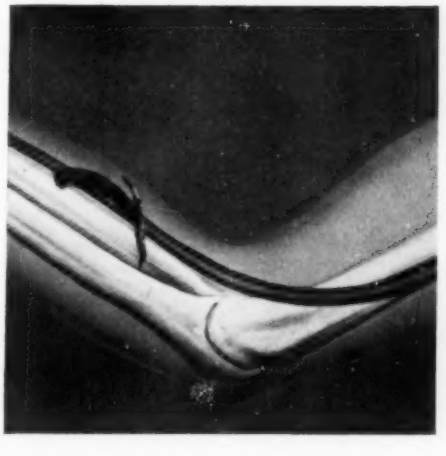
SENSITIVE seismograph instruments at the California Institute of Technology, set up to catch tremors telltelling of distant great earthquakes, are also recording the lesser earthquakes set up by heavy gunfire during naval target practice, off the nearby coast of California, reports Dr. Beno Gutenberg, who has charge of the Institute's work in geophysics. It is even possible, by close examination of the quivering lines of the instruments' tracings, to get some idea of the types of explosion causing them.

Science News Letter, May 16, 1942

The *mountain goat* is not a true goat, but is a member of the goat-antelope family to which the chamois belongs.

BRING THE WORLD TO THE CLASSROOM

FIRST AID
Wounds and Fractures



"Arterial bleeding of the lower arm can be stopped by pressure on the inside of the upper arm."

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•First Glances at New Books

LANGUAGE

THE GIFT OF TONGUES—Margaret Schlauch—*Modern Age Books,* 342 p., $3.50. The always fascinating subject of speech, from the birth of the alphabet to the intricacies of semantics, most interestingly set forth in language to be "understanded of the people."

Science News Letter, May 16, 1942

ZOOLOGY

HORNS AND ANTLERS—Wilfred S. Bronson—*Harcourt, Brace,* 143 p., illus., by author, $2. The principal horned mammals of North America (except bison) in vivid picture and lively text, by one of our best-known artist-naturalists.

Science News Letter, May 16, 1942

AERONAUTICS

DELAYED OPENING PARACHUTE JUMPS AND THEIR LIFE-SAVING VALUE—Arthur H. Starnes—*Parachute Science Service,* 85 p., illus., $1.50. The man who made the world's highest delayed-opening parachute jump (see SNL, Oct. 4, 1941, p. 213; Nov. 8, 1941, p. 294) tells of his exploit and of the scientific preparations for it, and gives specific instructions for airmen who may have occasion to use his technique when forced to "bail out" at high altitudes.

Science News Letter, May 16, 1942

MILITARY SCIENCE

AUTOMATIC ARMS, Their History, Development and Use—Melvin M. Johnson, Jr. and Charles T. Haven—*Morrow,* 344 p., illus., $5. This is one of the most important books on ordnance that has appeared in a good many years. It tells the history of machine guns and automatic rifles and pistols briefly, and then goes very thoroughly into the present-day status of all principal current makes, with of course special emphasis on those produced in this country. Treatment is non-technical but thorough and complete, so that the book will appeal alike to ordnance men, field troops and the interested general reader.

Science News Letter, May 16, 1942

BIBLIOGRAPHY

CURRENT NATIONAL BIBLIOGRAPHIES, A List of Sources of Information Concerning Current Books of all Countries (rev. ed.)—Lawrence Heyl, comp.—*American Library Assn.,* 19 p., 75c. From one to three good sources of book information for each country. In certain instances it has been necessary to group countries or entries, as Slavic and Arabic. Entries are briefly annotated, and addresses are given.

Science News Letter, May 16, 1942

HISTORY

ATROCITY PROPAGANDA 1914-1919 — James Morgan Read—*Yale Univ. Press,* 319 p., $3.50. By careful examination of source material in libraries, the author has analyzed the basis for atrocity stories during the first world war.

Science News Letter, May 16, 1942

• Just Off the Press •

THE BIOLOGY OF THE NEGRO—Julian Herman Lewis—*Univ. of Chicago Press,* 433 p., $5.

ENJOYING SCIENCE—Victor C. Smith, Gilbert H. Trafton and W. R. Teeters—*Lippincott,* 596 p., illus., $1.52.

ERECTING AND INSTALLATION WORK—E. Molloy—*Chemical Pub. Co.,* 128 p., illus., $2.50.

EXPLORING SCIENCE—Victor C. Smith, Gilbert H. Trafton and W. R. Teeters—*Lippincott,* 458 p., illus., $1.32.

IN SEARCH OF SANITY—Andrew Shirra Gibb—Farrar & Rinehart, 546 p., $5.

A MANUAL OF HOME VEGETABLE GARDENING —Francis C. Coulter—*Doubleday, Doran,* 279 p., illus., $2.50.

MATHEMATICS DICTIONARY—Glenn James and Robert C. James—*Digest Press,* 281 p., $3.

MEMORANDA ON MEDICAL DISEASES IN TROPICAL AND SUB-TROPICAL AREAS — Great Britain. The War Office—*Chemical Pub. Co.,* 282 p., $4.75.

MODERN-LIFE SCIENCE—Robert H. Carleton and Harry H. Williams—*Lippincott,* 650 p., illus., $2.40.

THE NATURE OF LITERATURE, Its Relation to Science, Language, and Human Experience—Thomas Clark Pollock—*Princeton Univ. Press,* 218 p., $3.

OCCUPATIONAL EXPLORATION—James H. Bedford and Albert F. Steelhead—*Soc. of Occupational Research,* 306 p., illus., $2.50.

OPEN FIRE! (Battle Stations! Enemy Sighted, Rendezvous, Night Action)—Alec Hudson—Macmillan, 289 p., $2.50. (Omnibus volume).

PACKAGING CATALOG, 1942—*Packaging Catalog Corp.,* 641 p., illus., $5.

POSTWAR PLANNING IN THE UNITED STATES —George B. Galloway—*Twentieth Century Fund,* 158 p., 60c.

PSYCHOLOGY—Floyd C. Dockeray—*Prentice-Hall,* 504 p., illus., $3.

REPRESENTATIVE NORTH AMERICAN FRESH-WATER FISHES—John T. Nichols—*Macmillan,* 128 p., illus., $1.25.

A SOUTHERN GARDEN, A Handbook for the Middle South—Elizabeth Lawrence—*Univ. of North Carolina Press,* 241 p., $3.

USING SCIENCE—Victor C. Smith, Gilbert H. Trafton and W. R. Teeters—*Lippincott,* 802 p., illus., $1.80.

THE VARIETIES OF TEMPERAMENT—W. H. Sheldon—Harper, 520 p., $4.50.

WAKE UP AND GARDEN!—The Complete Month-by-Month Gardener's Manual—Ruth Cross—*Prentice-Hall,* 326 p., illus., $2.95.

WELDING AND METAL CUTTING—E. Molloy—*Chemical Pub. Co.,* 112 p., illus., $2.50.

PHYSICS

URANIUM AND ATOMIC POWER—Jack De Ment and H. C. Dake—*Chemical Pub. Co.,* 335 p., $5. Atomic power will eventually be obtained from radium. This is the opinion of the authors, which they back up with a comprehensive study of uranium and uranium minerals from the standpoints of chemistry and of nuclear physics.

Science News Letter, May 16, 1942

MEDICINE

TIME AND THE PHYSICIAN — Autobiography of Lewellys F. Barker—*Putnam,* 350 p., $3.50. Medically minded laymen as well as physicians will welcome this autobiography of one of America's distinguished physicians. Dr. Barker has included many details about the non-medical side of his life — his family, friends and holiday sojournings.

Science News Letter, May 16, 1942

PSYCHOLOGY

CHILDREN IN A WORLD OF CONFLICT—Roy F. Street—*Christopher Pub. House,* 304 p., $2.50. "The primary purpose of this book is to examine some of the ways in which children respond to environments which are confusing and frequently hostile, and to indicate what might be done to help them make the most adequate adjustments."

Science News Letter, May 16, 1942

TECHNOLOGY

THE TECHNOLOGY OF NATURAL RESINS —C. L. Mantell, C. W. Kopf, J. L. Curtis and E. M. Rogers—*Wiley,* 506 p., illus., $7. This volume is devoted mostly to the much neglected natural resins of India and the East Indies, the technology of their handling, their properties and combinations with other materials, and uses. The treatment is practical.

Science News Letter, May 16, 1942

EDUCATION

THE EDUCATION OF FREE MEN IN AMERICAN DEMOCRACY — *Educational Policies Commission,* 115 p., 50c. Responsibility for democratic education should be lodged in no single authority, but in government, teachers, and the people. Obligations of each are outlined.

Science News Letter, May 16, 1942

TECHNOLOGY

ART METALWORK, A Manual for Amateurs—Emil F. Kronquist—*Whittlesey House,* 204 p., illus., $2.75. A book for Science Club bookshelves.

Science News Letter, May 16, 1942